What is claimed is:

1.   A process for extractively removing nickel(0) complexes having phosphorus
     ligands and/or free phosphorus ligands from a reaction effluent of a
     hydrocyanation of unsaturated mononitriles to dinitriles by extraction by means of
     a hydrocarbon, a phase separation of the hydrocarbon and of the reaction
     effluent into two phases being effected at a temperature T (in °C),

     wherein the content of nickel(0) complexes having phosphorus ligands and/or
     free phosphorus ligands in the reaction effluent of the hydrocyanation, depending
     on the temperature T, is at least y% by weight and, irrespective of the
     temperature T, is a maximum of 60% by weight, where the numerical value of the
     minimum content y is given by the equation

     $$y = 0.5 \cdot T + 20$$

     and T is to be used in the equation as a dimensionless numerical value.

2.   The process according to claim 1, wherein the reaction effluent of the
     hydrocyanation is treated before or during the extraction with ammonia or a
     primary, secondary or tertiary aromatic or aliphatic amine.

3.   The process according to claims 1 to 2, wherein the reaction effluent is treated
     with anhydrous ammonia.

4.   The process according to claims 1 to 3, wherein the hydrocarbon used is
     cyclohexane, methylcyclohexane, n-heptane or n-octane.

5.   The process according to claims 1 to 4, wherein the hydrocarbon used is
     n-heptane or n-octane.

6.   The process according to claims 1 to 5, wherein the solids present in the reaction
     effluent are at least partly removed before the extraction.

7.   The process according to claims 1 to 6, wherein the phase separation of the
     extraction is carried out at a temperature of from −15 to 120°C.

8.   The process according to claims 1 to 7, wherein, in that region of the extraction in
     which the content of nickel(0) complexes having phosphorus ligands and/or free
     phosphorus ligands is higher than in the other region, the temperature is lower
     than in the other region.

9. The process according to claims 1 to 8, wherein the phosphorus ligand is selected selected from mono- or bidentate phosphines, phosphites, phosphinites and phosphonites.

10. The process according to claims 1 to 9, wherein the phosphorus ligand is selected from tritolyl phosphite, bidentate phosphorus chelate ligands, and phosphites of the formula Ib

$$P (O\text{-}R^1)_x (O\text{-}R^2)_y (O\text{-}R^3)_z (O\text{-}R^4)_p \qquad\qquad (I\ b)$$

where R^1, R^2 and R^3 are each independently selected from o-isopropylphenyl, m-tolyl and p-tolyl, R^4 is phenyl, x is 1 or 2, and y, z, p are each independently 0, 1 or 2, with the proviso that $x+y+z+p = 3$; and mixtures thereof.

11. The process according to claims 1 to 10, wherein the mononitrile is 3-pentenenitrile and the dinitrile is adiponitrile.

12. The process according to claims 1 to 11, wherein the reaction effluent is obtained by reacting 3-pentenenitrile with hydrogen cyanide in the presence of at least one nickel(0) complex having phosphorus ligands, if appropriate in the presence of at least one Lewis acid.